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[TED 11: Automotive Electrical Equipment]

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Indian Standard

ROAD VEHICLES — FUSE-LINKS

PART 7 FUSE-LINKS WITH TABS (TYPE G) WITH RATED VOLTAGE OF 450 V

(Second Revision)

ICS 43.040.10

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

September 2012 **Price Group 7**

Automotive Electrical Equipments and Instruments Sectional Committee, TED 11

NATIONAL FOREWORD

This Indian Standard (Part 7) (Second Revision) which is identical with ISO 8820-7 : 2007 'Road vehicles — Fuse-links — Part 7: Fuse-links with tabs (Type G) with rated voltage of 450 V' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Automotive Electrical Equipments and Instruments Sectional Committee and approval of the Transport Engineering Division Council.

This standard was first published in 1963 and revised in 1974. In this revision the standard has been thoroughly updated with respect to types, test requirements and user's guide. In line with ISO, this standard has been brought out in seven parts.

This standard is one of the series of Indian Standards on fuse-links for automotive vehicles. Other parts in this series are:

Part 1	Definitions and general test requirements
Part 2	User's guide
Part 3	Fuse-links with tabs (Blade type)
Part 4	Fuse-links with female contacts (Type A) and bolt-in contacts (Type B) and their test fixtures
Part 5	Fuse-links with axial terminals (Strip fuse-links) types SF 30 and SF 51 and test fixtures
Part 6	Single-bolt fuse-links

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 6722 : 2006 Road vehicles — 60 V and 600 V single-core cables — Dimensions, test methods and requirements	IS/ISO 6722 : 2006 Road vehicles — 60 V and 600 V single-core cables — Dimensions, test methods and requirements	Identical
ISO 8820-1 : 2008 Road vehicles — Fuse-links — Part 1: Definitions and general test requirements	IS 2577 (Part 1) : 2012 Road vehicles — Fuse-links: Part 1 Definitions and general test requirements (*second revision*)	do

(*Continued on third cover*)

Indian Standard

ROAD VEHICLES — FUSE-LINKS

PART 7 FUSE-LINKS WITH TABS (TYPE G) WITH RATED VOLTAGE OF 450 V

(Second Revision)

1 Scope

This part of ISO 8820 specifies fuse-links with tabs (Type G) in road vehicles. This type of fuse-link is basically designed for use in fuel-cell applications. This part of ISO 8820 establishes, for this fuse-link type, the rated current, test procedures, performance requirements and dimensions.

This part of ISO 8820 is applicable for fuse-links with a rated voltage of 450 V, a current rating of $\leqslant$ 70 A and a breaking capacity of 2 000 A intended for use in road vehicles at a nominal voltage up to 450 V.

This part of ISO 8820 is intended to be used in conjunction with ISO 8820-1:—[1] and ISO 8820-2. The numbering of its clauses corresponds to that of ISO 8820-1:—[1], the requirements of which are applicable except where modified by requirements particular to this part of ISO 8820.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6722, *Road vehicles — 60 V and 600 V single-core cables — Dimensions, test methods and requirements*

ISO 8092-1, *Road vehicles — Connections for on-board electrical wiring harnesses — Part 1: Tabs for single-pole connections — Dimensions and specific requirements*

ISO 8820-1:—[1], *Road vehicles — Fuse-links — Part 1: Definitions and general test requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8820-1:—[1] apply.

---

[1] To be published. (Revision of ISO 8820-1:2002)

4 Marking, labelling and colour coding

The requirements given in ISO 8820-1:—[1] and in Table 1 of this part of ISO 8820 apply.

Table 1 — Fuse-link colour coding

Fuse-link rating A	**Colour**
10	red
15	blue
20	yellow
25	white (natural)
30	green
35	dark green
40	orange
50	red
60	blue
70	brown

5 Tests and requirements

5.1 General

In addition to carrying out the test procedures in accordance with ISO 8820-1:—[1], the following criteria apply.

- Tests shall be performed following the test sequence in Table 2.
- The test fixtures for electrical tests shall be designed in accordance with Figures 3 and 4. The connection resistance shall be $\leqslant 1{,}0\ \mathrm{m}\Omega$ to ensure the proper function of the test fixture. As two or more fuse-links are tested in series, they shall be mounted not less than 150 mm apart.

5.1.1 Test sequence

Table 2 — Test sequence

No.	Test		Clause	Sample group					
				1	2	3	4	5	6
1	Dimensions		6	X	X	X			
2	Marking, labelling and colour coding		4	X	X	X	X	X	X
3	Fuse-link voltage drop		5.2	X	X	X			
4	Strength of terminals		5.6	X	X	X			
5	Accelerated ageing		5.4			X			
6	Fluid compatibility						X		
7	Vibration							X	
8	Transient current cycling		5.3						X
9	Fuse-link voltage drop		5.2			X	X	X	X
10	Operating time rating	$2I_R$	5.5		Y	Y	Y	Y	Y
		300 A			Y	Y	Y	Y	Y
		2 000 A [a]			Y	Y	Y	Y	Y
11	Strength of terminals		5.8	X	X	X	X	X	X

[a] This current is used to test the breaking capacity (see 5.5 and 5.7).

Y For these operating time tests, the sample groups 2, 3, 4, 5 and 6 shall be divided equally. These fuses are intended to be subjected to a single operating time test only.

5.1.2 Test cable sizes

Test cable sizes shall be as given in Table 3. All tests for a particular fuse-link rating shall be performed using the same cable size.

Test cable sizes are specified to allow comparative fuse-link tests to be carried out. The cable size specified does not necessarily indicate the size of cable to be used in the vehicle application.

Only thick-wall cables as specified in ISO 6722 shall be used for testing.

Table 3 — Test cable sizes

Fuse-link rating A	Conductor cross-sectional area [a] mm^2
10	1,0
15	1,5
20	2,5
25	
30	4
35	
40	10
50	
60	10
70	16

[a] Conductor material according to ISO 6722.

5.2 Voltage drop

5.2.1 Test

The fuse-link voltage drop U_{ab} shall be measured at points a and b across the fuse-link tabs, as shown in Figure 5, or U_{ab} and U_{cd} shall be measured at points a, b and c, d across the fuse-link tabs, as shown in Figure 7.

5.2.2 Requirements

Table 4 gives the voltage drop requirements.

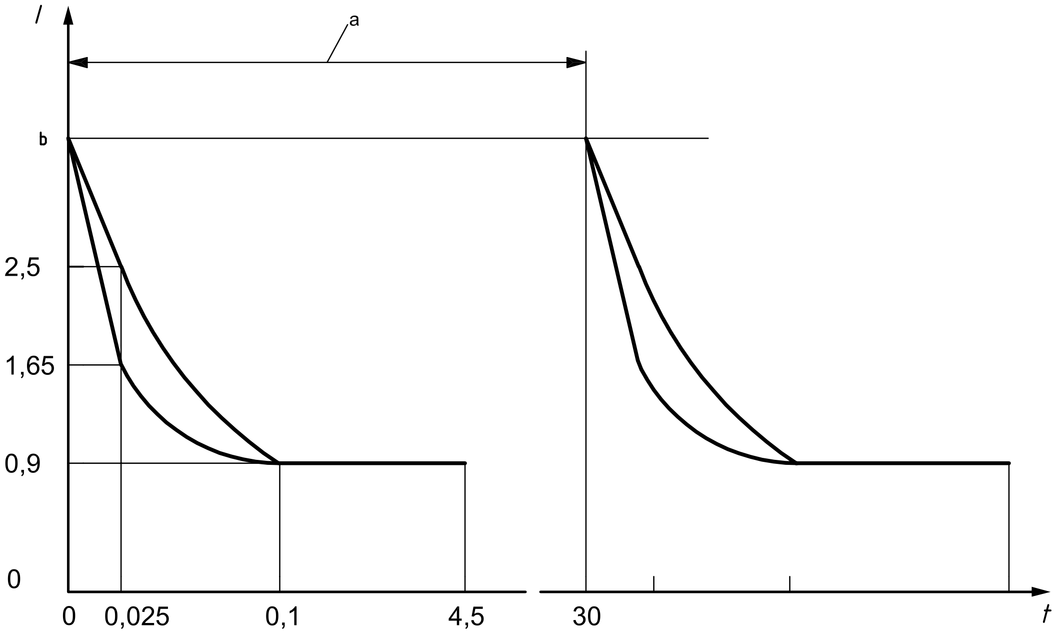
Table 4 — Fuse-link voltage drop

Fuse-link rating A	Voltage drop V
1	2,000
5	0,400
10	0,200
15	0,190
20	0,175
25	0,140
35	0,114
50	0,080
70	0,080

5.3 Transient current cycling

5.3.1 Test

See Figure 1 and ISO 8820-1. At an elapsed time of 0,025 s on-time, the current shall fall to a value between 1,65I_R and 2,5I_R. At no time shall the steady-state current fall below 0,9I_R.



Key

I current [I_R]
t time [s]

[a] One cycle.

[b] (5,6 … 6)I_R for $I_R > 5$ A; (4,6 … 5)I_R for $I_R \leqslant 5$ A.

Figure 1 — Transient current cycling

5.3.2 Requirement

The requirements given in ISO 8820-1 apply.

5.4 Environmental conditions

The tests and requirements given in ISO 8820-1:—[1)] apply.

5.5 Operating time rating

5.5.1 Test

The tests given in ISO 8820-1:—[1)] apply.

The rated voltage U_R shall be maintained for a period of at least 30 s after the fuse-link is activated.

For breaking capacity, the time constant shall be 7,5 ... 10 ms.

5.5.2 Requirement

The requirements given in ISO 8820-1 apply.

The voltage during operation of the fuse-link shall not exceed 2 000 V.

See Tables 5 and 6. After activation, the current through the fuse-link shall not exceed 5 mA at the rated voltage of the fuse-link.

Table 5 — Operating time rating for fuse-links with $I_R < 35$ A

Test current	Operating time s	
	min.	max.
$2I_R$	20	200
300 A	0	0,1
2 000 A [a]	0	0,01

[a] This current is used to test the breaking capacity.

Table 6 — Operating time rating for fuse-links $I_R \geqslant 35$ A

Test current	Operating time s	
	min.	max.
$2I_R$	60	600
300 A	0	10
2 000 A [a]	0	0,01

[a] This current is used to test the breaking capacity.

5.6 Current steps

This test does not apply to this type of fuse-link.

5.7 Breaking capacity

The tests and requirements are given in 5.5.

5.8 Terminal strength

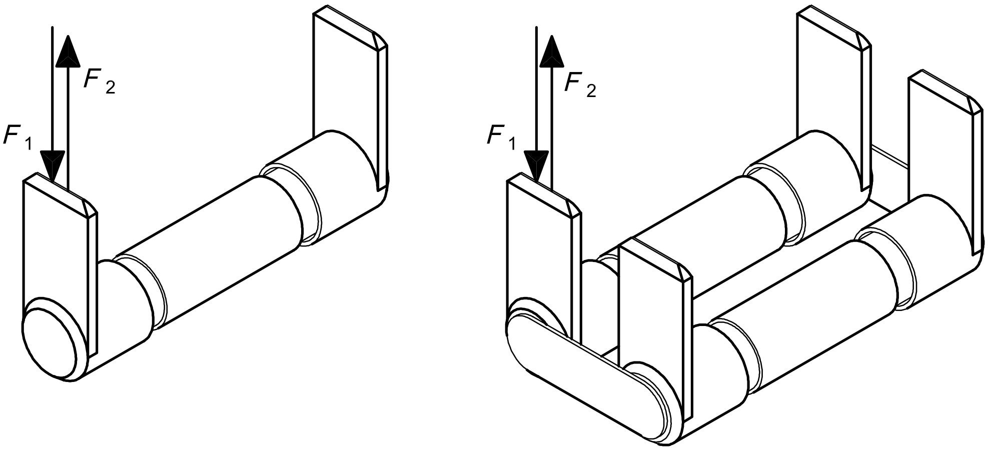
5.8.1 Test

A force (F_1, F_2) shall be applied to the tabs of the fuse-link in accordance with Table 7 and Figure 2.

5.8.2 Requirement

Table 7 — Terminal push and pull forces

Fuse-link rating A	**Push (F_1) and pull (F_2) forces** N
< 35	90 ± 1
⩾ 35	90 ± 1 (each tab)



Key

F_1 push force
F_2 pull force

Figure 2 — Terminal push and pull forces

6 Dimensions and designation examples

6.1 Types

Table 8 — Types

Fuse-link rating A	**Type in accordance with Figure …**
< 35	3
⩾ 35	4

6.2 Fuse-links with $I_R < 35$ A

Dimensions in millimetres

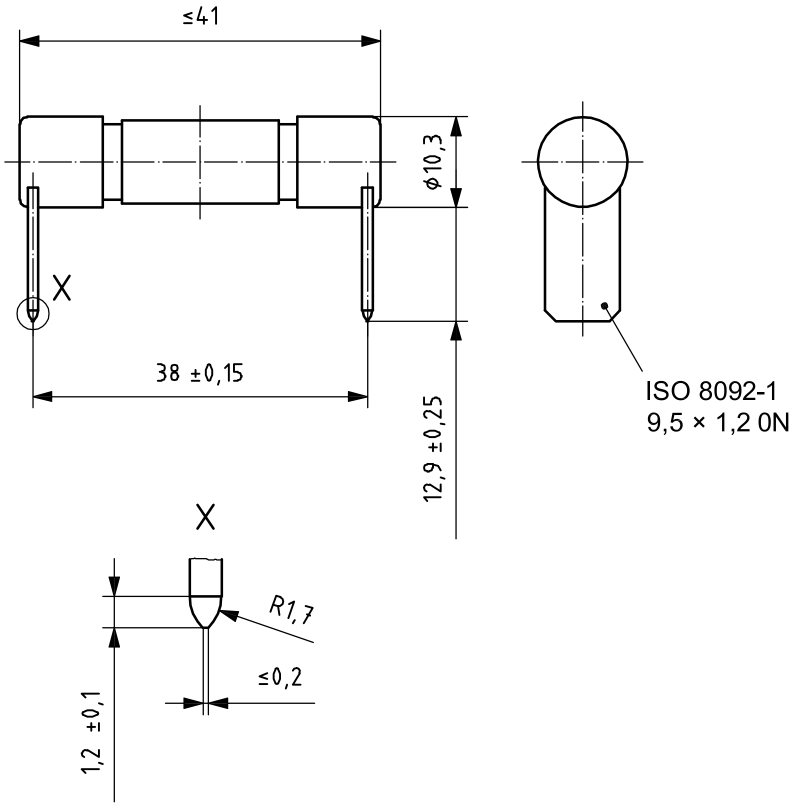


Figure 3 — Fuse-links with $I_R < 35$ A

6.3 Fuse-links with $I_R \geqslant 35$ A

Dimensions in millimetres

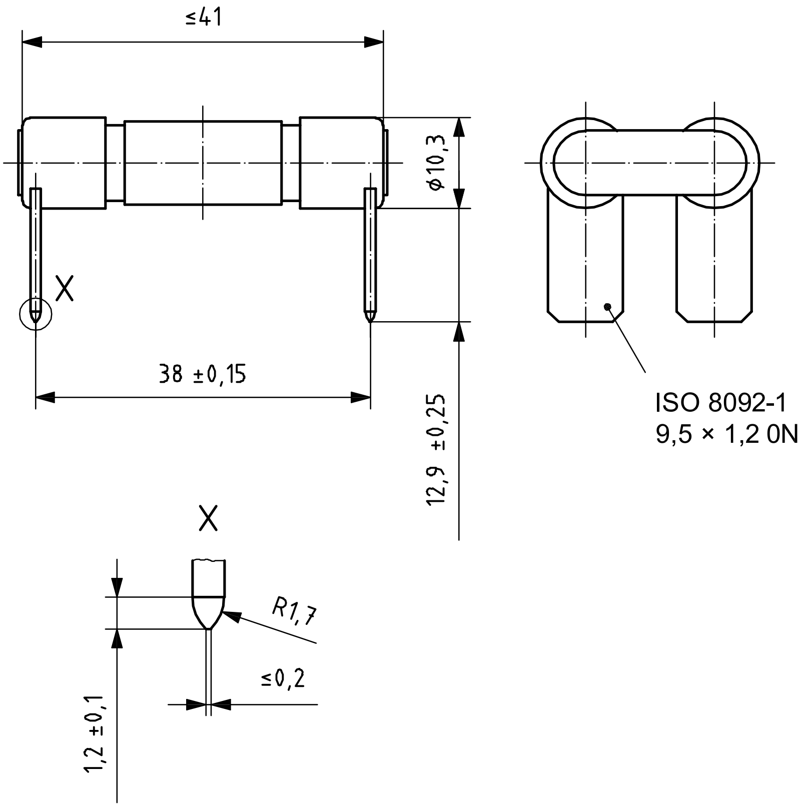


Figure 4 — Fuse-links with $I_R \geqslant 35$ A

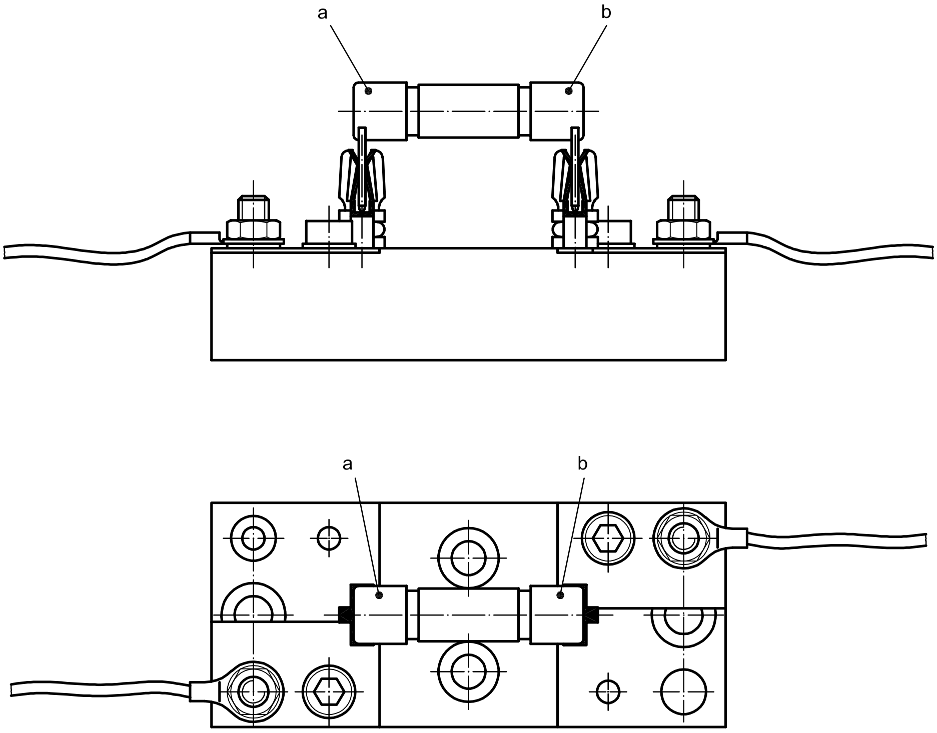
6.4 Designation example

Designation of a fuse-link in accordance with this part of ISO 8820 for a rated current of 25 A:

Fuse-link ISO 8820 – G – 25

7 Test fixture

7.1 Test fixture for fuse-links with $I_R < 35$ A



Key

a, b measuring points for cold resistance

Figure 5 — Measuring points for fuse-links with $I_R < 35$ A

Dimensions in millimetres

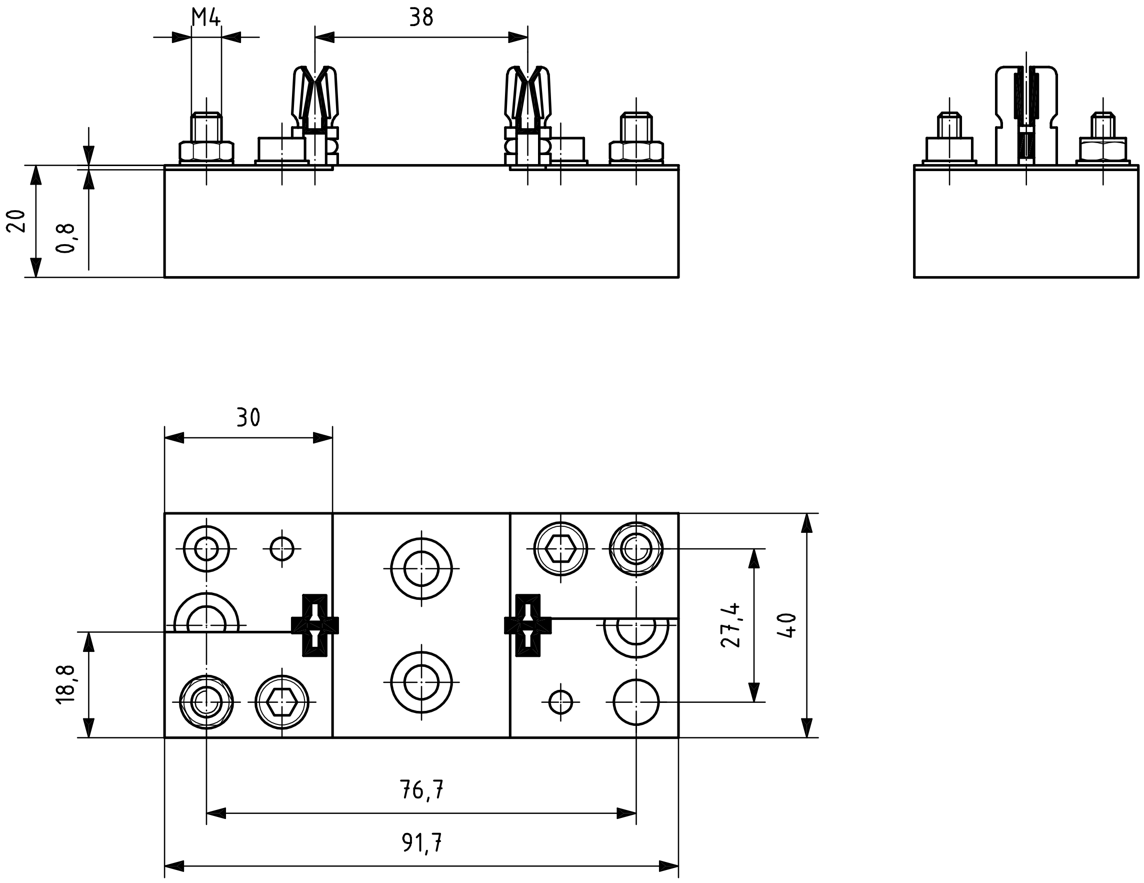
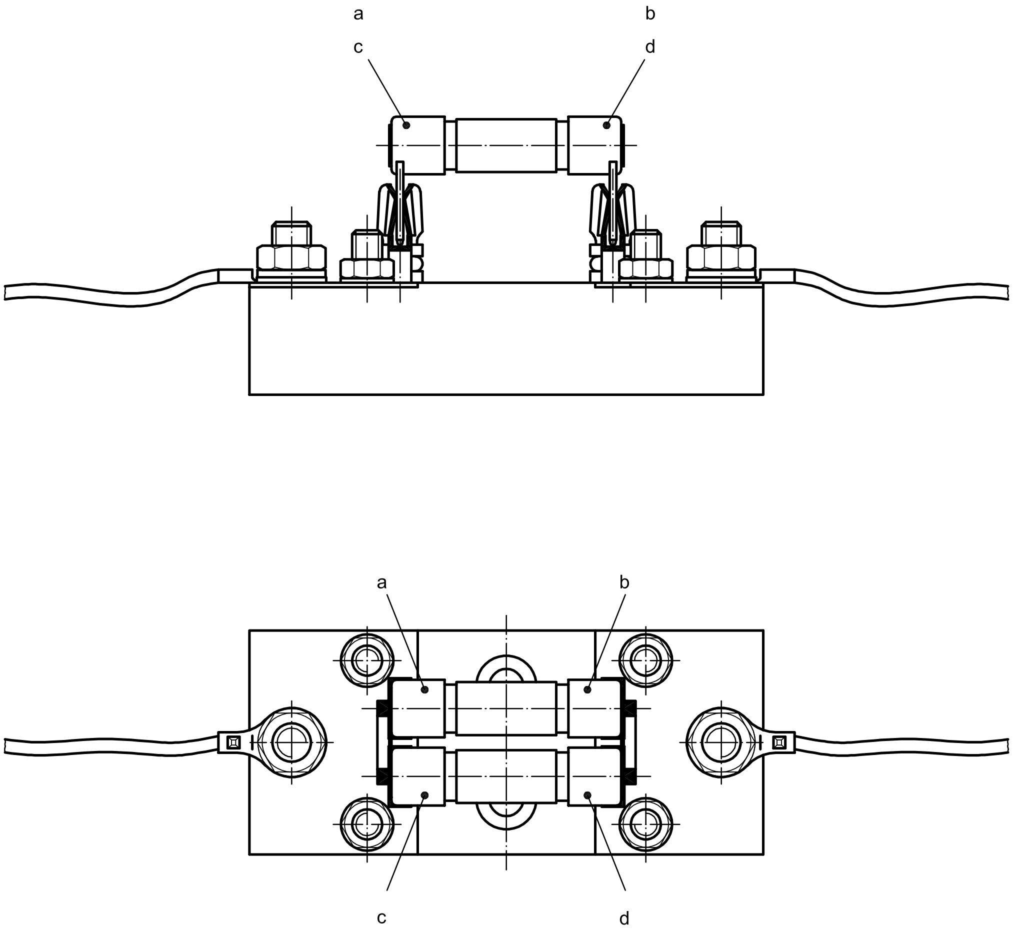


Figure 6 — Test fixture for fuse-links with $I_R < 35$ A

7.2 Test fixture for fuse-links with $I_R \geqslant 35$ A



Key

a, b and c, d measuring points for cold resistance

Figure 7 — Measuring points for fuse-links with $I_R \geqslant 35$ A

Dimensions in millimetres

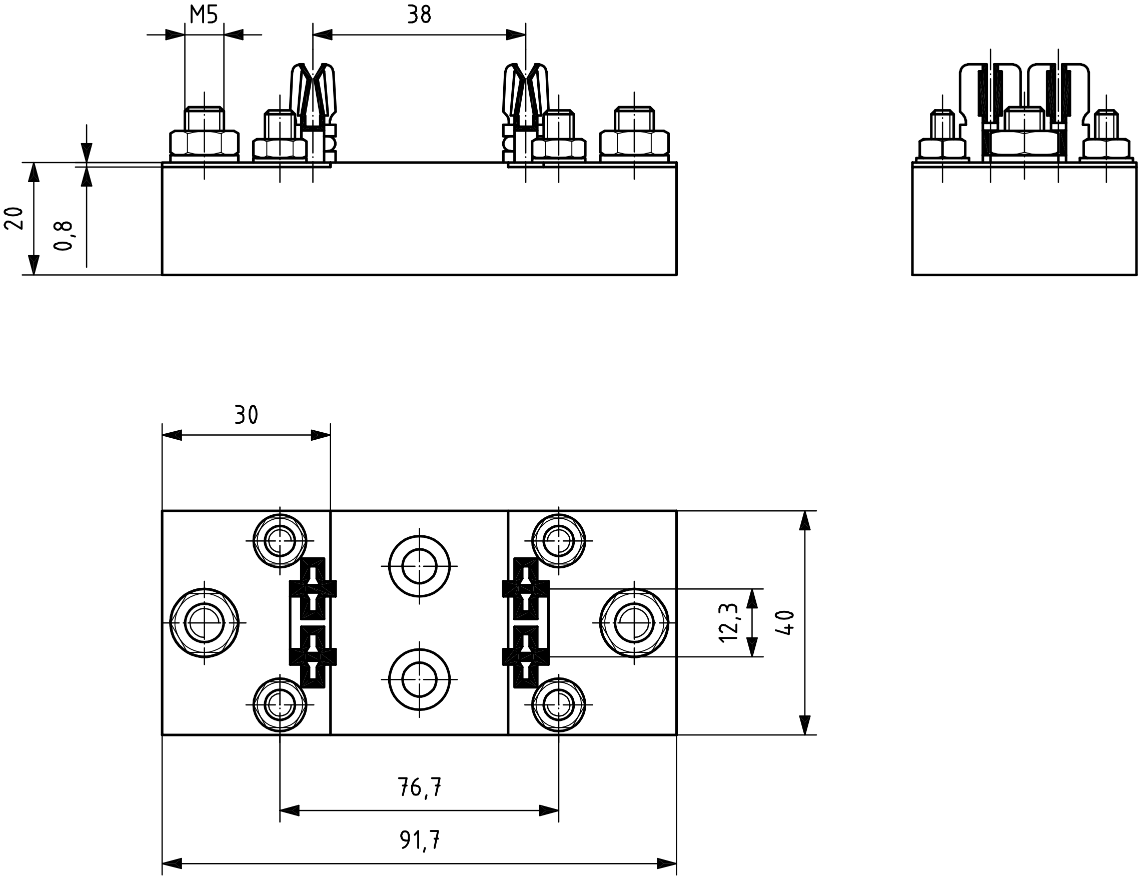


Figure 8 — Test fixture for fuse-links with $I_R \geqslant 35$ A

Bibliography

[1] ISO 8820-2, *Road vehicles — Fuse-links — Part 2: User's guide*

NATIONAL ANNEX A

(*National Foreword*)

A-1 BIS CERTIFICATION MARKING

The product may also be marked with the Standard Mark.

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(*Continued from second cover*)

The technical committee has reviewed the provision of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO 8092-1 : 1996	Road vehicles — Connections for on-board electrical wiring harnesses — Part 1: Tabs for single-pole connections — Dimensions and specific requirements

In order to protect the automobile electrical equipments against excessive currents, fuse-links are inserted. Owing to number of circuits and accessories, it might become necessary to insert fuse-links into each circuit depending on the load requirements. This standard is intended to cover such fuse-links for automobiles.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. BIS shall not be held responsible for identifying any or all such patent rights.

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This Indian Standard has been developed from Doc No.: TED 11 (754).

Amendments Issued Since Publication

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